

# OXIDATION OF METALS—Volume 20, 1983

A journal which provides a single forum for scientific contributions dealing with all aspects of gas-solid reactions. It includes results of experimental and theoretical work; review papers will be published occasionally

## Editor

D. L. Douglass  
Materials Department  
University of California at Los Angeles  
Los Angeles, California

F. S. Pettit  
University of Pittsburgh  
Pittsburgh, Pennsylvania

## Associate Editors

J. B. Wagner, Jr.  
Center for Solid State Science  
Arizona State University  
Tempe, Arizona

G. C. Wood  
Corrosion and Protection Centre  
University of Manchester Institute of Science  
and Technology  
Manchester, England

## International Advisory Board

J. Bénard  
Université de Paris  
Paris, France

A. Rahmel  
DECHEMA  
Frankfurt am Main, West Germany

C. E. Birchenall  
University of Delaware  
Newark, Delaware

R. A. Rapp  
Ohio State University  
Columbus, Ohio

J. V. Cathcart  
Oak Ridge National Laboratory  
Oak Ridge, Tennessee

J. Sheasby  
University of Western Ontario  
London, Ontario, Canada

G. Gesmundo  
Istituto di Chimica Fisica  
Consiglio Nazionale delle Ricerche  
Genova, Italy

M. J. Graham  
National Research Council of Canada  
Ottawa, Ontario, Canada

W. W. Smeltzer  
McMaster University  
Hamilton, Ontario, Canada

D. R. Holmes  
Central Electricity Research Laboratories  
Leatherhead, Surrey, England

J. Stringer  
Electric Power Research Institute  
Palo Alto, California

P. Kofstad  
University of Oslo  
Oslo, Norway

D. J. Young  
New South Wales,  
Kensington, N.S.W., Australia

S. Mrowec  
Institute of Materials Science  
School of Mining and Metallurgy  
Krakow, Poland

K. Nishida  
Hokkaido University  
Sapporo, Japan

G. J. Yurek  
Massachusetts Institute of Technology  
Cambridge, Massachusetts

Published bimonthly at Winterstoke Road, Bristol BS3 2NT, England, by Plenum Publishing Corporation, 233 Spring Street, New York, N.Y. 10013. In 1983, Volumes 19 and 20 (6 issues each) will be published. Subscription orders should be addressed to the publisher. *Oxidation of Metals* is abstracted or indexed in Chemical Abstracts, Chemical Titles, Corrosion Abstracts, Current Contents, Energy Research Abstracts, Engineering Index, Metals Abstracts Index, Referativnyi Zhurnal, Science Citation Index, and Solid State Abstracts Journal. © 1983 Plenum Publishing Corporation. *Oxidation of Metals* participates in the Copyright Clearance Center (CCC) Transactional Reporting Service. The appearance of a code line at the bottom of the first page of an article in this journal indicates the copyright owner's consent that copies of the article may be made for personal or internal use. However, this consent is given on the condition that the copier pay the flat fee of \$3.00 per copy per article (no additional per-page fee) directly to the Copyright Clearance Center, Inc., 21 Congress Street, Salem, Massachusetts 01970, for all copying not explicitly permitted by Section 107 or 108 of the U.S. Copyright Law. The CCC is a nonprofit clearinghouse for the payment of photocopying fees by libraries and other users registered with the CCC. Therefore, this consent does not extend to other kinds of copying, such as copying for general distribution, for advertising or promotional purposes, for creating new collective works, or for resale, nor to the reprinting of figures, tables, and text excerpts. 0030-770X/83 \$3.00

## Subscription rates:

Volumes 19 and 20, 1983 (6 issues each) \$175.00 per volume (outside the U.S., \$195.00 per volume).

Volumes 21 and 22, 1984 (6 issues each) \$190.00 per volume (outside the U.S., \$212.00 per volume).

Second-class postage paid at Jamaica, N.Y. 11431. Postmaster: Send address changes to *Oxidation of Metals*, Plenum Publishing Corporation, 233 Spring Street, New York, N.Y. 10013. Air Freight and mailing in the USA by Publications Expediting, Inc., 200 Meacham Avenue, Elmont, N.Y. 11003.

Printed in Great Britain.

*Oxidation of Metals* is published bimonthly at Winterstoke Road, Bristol, BS3 2NT, England, by Plenum Publishing Corporation, 233 Spring Street, New York, N.Y. 10013. In 1983, Volumes 19 and 20 (6 issues each) will be published. Subscription orders should be addressed to the publisher. *Oxidation of Metals* is abstracted or indexed in Chemical Abstracts, Chemical Titles, Corrosion Abstracts, Current Contents, Energy Research Abstracts, Engineering Index, Metals Abstracts Index, Referativnyi Zhurnal, Science Citation Index, and Solid State Abstracts Journal. © 1983 Plenum Publishing Corporation. *Oxidation of Metals* participates in the Copyright Clearance Center (CCC) Transactional Reporting Service. The appearance of a code line at the bottom of the first page of an article in this journal indicates the copyright owner's consent that copies of the article may be made for personal or internal use. However, this consent is given on the condition that the copier pay the flat fee of \$3.00 per copy per article (no additional per-page fees) directly to the Copyright Clearance Center, Inc., 21 Congress Street, Salem, Massachusetts 01970, for all copying not explicitly permitted by Sections 107 or 108 of the U.S. Copyright Law. The CCC is a nonprofit clearinghouse for the payment of photocopying fees by libraries and other users registered with the CCC. Therefore, this consent does not extend to other kinds of copying, such as copying for general distribution, for advertising or promotional purposes, for creating new collective works, or for resale, nor to the reprinting of figures, tables, and text excerpts. 0030-770X/83 \$3.00

## OXIDATION OF METALS

Vol. 20, Nos. 1/2

August 1983

---

### CONTENTS

The Oxidation of Binary Iron-Manganese Alloys <i>P. R. S. Jackson and G. R. Wallwork</i>	1
The Influence of Thermal Cycling on the Oxidation and Oxide Spallation of a 1%Cr-0.5%Mo Low-Carbon Steel <i>R. Rolls and M. Nematollahi</i>	19
Oxidation of Ternary Co-Cr-W Alloys <i>S. Espevik, R. A. Rapp, P. L. Daniel, and J. P. Hirth</i>	37

---



## OXIDATION OF METALS

Vol. 20, Nos. 3/4

October 1983

---

### CONTENTS

On the Development of Plasma-Sprayed Thermal Barrier Coatings <i>R. Sivakumar and M. P. Srivastava</i>	67
The Oxidation of High-Purity Iron-Chromium-Aluminum Alloys at 800°C <i>P. Tomaszewicz and G. R. Wallwork</i>	75
The Corrosion of Chromium and Nickel-Chromium Alloys in Oxygen-Sulfur-Carbon Gases at 800°C <i>Dacheng Wang and D. L. Douglass</i>	111
The Influence of Impurities on the Kinetics and Morphology of the Displacement Reaction Between Ni or Co and Cu <sub>2</sub> O <i>P. J. C. Vosters, M. A. J. Th. Laheij, F. J. J. van Loo, and R. Metselaar</i>	147
The Corrosion of Ferritic Stainless Steels and High-Purity Fe-Cr Alloys in Basaltic Lava and Simulated Magmatic Gas <i>D. L. Douglass</i>	161

---

## OXIDATION OF METALS

Vol. 20, Nos. 5/6

December 1983

---

Chemical Composition and Interface Chemistry of Very Thin Nb <sub>2</sub> O <sub>5</sub> Films Prepared by rf Plasma Oxidation <i>R. A. Pollak, H. J. Stolz, S. I. Raider, and R. F. Marks</i>	185
On the Mechanical Behavior of Brittle Coatings and Layers <i>A. G. Evans, G. B. Crumley, and E. Demeray</i>	193
The Corrosion of Nickel in 1 atm of Pure SO <sub>2</sub> at 600–1000°C and the Mechanism of Formation of the Two-Layered Scales <i>F. Gesmundo, C. de Asmundis, and P. Nanni</i>	217
Application of Microcalorimetry in Studies of Interaction Between Oxygen and NiO Single Crystals <i>R. Lalauze, M. Soustelle, M. Rekas, and J. C. Le Thiesse</i>	241
The Effects of Cr, Al, Ti, Mo, W, Ta, and Cb on the Cyclic Oxidation Behavior of Cast Ni–Base Superalloys at 1100 and 1150°C <i>C. A. Barrett, R. V. Miner, and D. R. Hull</i>	255
Announcement	279
Author Index to Volume 20	281
Subject Index to Volume 20	283

---

